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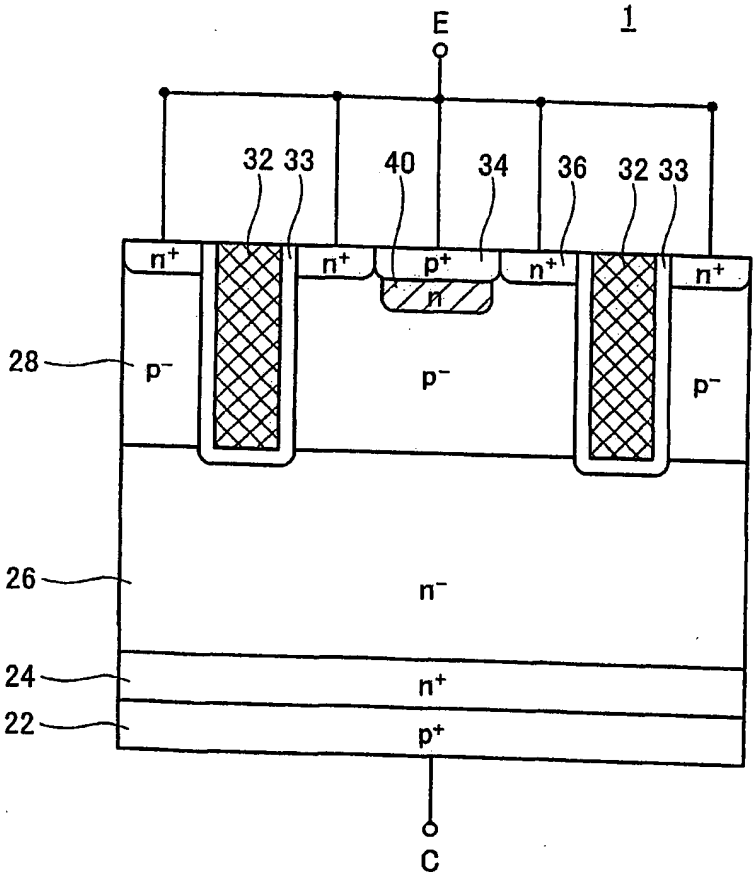
(54) Title: TRENCH GATE FIELD EFFECT DEVICES



(57) Abstract: The present invention relates to a technique for reducing the on-voltage of the semiconductor device by increasing the concentration of minority carriers in the deep region (26) and the intermediate region (28). A semiconductor device according to the invention comprises an electrode, a top region (36) of a second conductivity type connected to the electrode, a deep region of the second conductivity type, and an intermediate region of a first conductivity type connected to the electrode. A portion of the intermediate region isolates the top region and the deep region. The semiconductor device further comprises a gate electrode (32) facing the portion of the intermediate region via an insulating layer. The portion facing the gate electrode isolates the top region and the deep region. The semiconductor device according to the invention further comprises a barrier region (40) that is formed within the intermediate region and/or the top region.

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